Recycled Does Not Mean Weaker

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Why Was This Project Chosen?

- Advancements in the recycling process and a social push towards a more eco friendly production stream

Brief History

- 1031 - First Instance of Paper Recycling found in Japan

Brief History

- 1690 – Rittenhouse Mill Philadelphia USA

Brief History

- 1896 – Benedetto Family

Brief History

- 1993 – More paper recycled than thrown away
How Paper is Recycled Today

- Paper is taken from blue recycling bins
- Separated
- Mixed with water to create a slurry
- Slurry created into paper
  - Through additives and addition of virgin fibers

Project Scope

- To test the endurance of virgin fiber papers and recycled fiber papers and analyze paper bonds between the substrates.
- To see exactly by how much recycled fiber papers are weakened due to the recycling process.
- To see how various inks change the results.

Equipment Used

- The folding endurance tester - M.I.T. Tinius Olsen
- A microscope - Dino-Lite
- A QuickPeek kit - Thwing-Albert
- Phantom proofer QD - HarperScientific

Materials Used

- Lithographic Ink - HuberGroup
- Flexographic Ink – Siegwerk
- Papers supplied through Spicers (50# to 70#):
  - Domtar
  - International
  - Rolland

Experiment Procedure

- Papers inked and dried for 24 hours.
- 10 samples of grain long and 10 samples of grain short measured using endurance tester.
- Tears evaluated through a microscope.

Data Collected
No Ink Results

- Virgin Fiber:
  - Grain Long: 25
  - Grain Short: 13
- Recycled Fiber:
  - Grain Long: 21
  - Grain Short: 23
- 14.46% Difference

Offset Lithographic Ink Results

- Virgin Fiber:
  - Grain Long: 11
  - Grain Short: 6
- Recycled Fiber:
  - Grain Long: 14
  - Grain Short: 7
- 21.56% Difference

Flexographic Ink Results

- Virgin Fiber:
  - Grain Long: 9
  - Grain Short: 12
- Recycled Fiber:
  - Grain Long: 17
  - Grain Short: 10
- 35.9% Difference

Virgin Fiber vs Recycled Fiber Overall

- The Average folding endurance for all papers is 11.
- 4 out of 6 of the recycled fiber papers exceeded the average.

Microscopic Image Analysis

Virgin

Recycled

What Does This Mean?

- The study shows that in some cases recycled fibers may be able to be as good or even outperform virgin fiber papers.
- Recycled fiber papers have come a long way from being "The Weaker Paper".
- Please note that this is a small sample of all the available papers products out there.
What Does This Mean For The Future?

• One day we can confidently say for all of our printed products:

  “Recycled does not mean weaker”

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